

WHAT IS CLAIMED IS:

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1. A method for embossing a fibrous web containing contaminants to improve the bulk and softness of the web by passing the web through a nip formed by a pair of rotating rollers, wherein the contaminants will not damage the rollers, the method comprising:
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- a) providing a first embossing roller having an outer surface, said outer surface having a plurality of male protuberances thereon corresponding to a desired embossed pattern;
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- b) providing a second embossing roll having an outer surface having a plurality of female recessed portions which are matched to the male protuberances of the first roll;
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- c) wherein one of said first and second embossing rollers has a Shore A hardness of 40-65 and the other roller has a Shore A hardness of at least about 90; and
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- d) placing the rolls in contact to form a nip between the rolls, with the protuberances of the first roll entering the recesses of the second roll as the rolls rotate together; and passing a fibrous web through the nip formed by the rolls to emboss the web wherein the roller having the Shore A hardness of 40-65 will deform if any contaminants are encountered in the fibrous web.
2. The method of claim 1, wherein the step of providing a second roller includes utilizing a laser to form the recesses in the second roll, by removing portions

of the material from the outer surface.

3. The method of claim 1, wherein the roller having a Shore A hardness of 40-65 comprises material selected from the group consisting of natural rubber, synthetic rubber and plastic.

4. The method of claim 1, wherein the roller having a Shore A hardness of at least about 90 is constructed of steel.

Apparatus for embossing a fibrous web containing contaminants so that the contaminants will not damage the rollers, comprising:

- a) a first rotating embossing roller having an outer surface, said outer surface having a plurality of male protuberances thereon corresponding to a desired embossed pattern;
- b) a second rotating embossing roller having an outer surface having a plurality of female recessed portions which are matched to the male protuberances of the first roller;
- c) wherein one of said first and second embossing rollers have differing hardnesses; and
- d) wherein the first and second rollers are disposed to form a nip between the rolls, with the protuberances of the first roll entering the recesses of the second roll as the rolls rotate together; to permit the fibrous web thermoplastic through the nip formed by the rollers, wherein the roller having the lesser hardness will deform upon contact with a

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contaminant in the fibrous web.

- 5 6. The apparatus as claimed in claim 5 wherein one of said first and second embossing rollers has a Shore hardness of 40-65 and the other roller has a Shore A hardness of at least about 95.
7. The apparatus as claimed in claim 6 wherein the roller having a Shore A hardness of at least about 95 is constructed of steel.
- 10 8. The apparatus as claimed in claim 6 wherein the roller having a Shore A hardness of 40-65 comprises material selected from the group consisting of natural rubber, synthetic rubber and plastic.
- 15 9. The apparatus as claimed in claim 5 wherein one of said first and second embossing rollers has a Shore A hardness of about 60-65.
- 20 ~~10. A method to update paper embossing machinery having matched pairs of embossing rollers to enable the machinery to accommodate pulp that may contain contaminants, comprising the steps of:~~
- 25 a) ~~providing an embossing roller comprising material having a Shore A hardness of 40-65;~~
- b) ~~utilizing one of each pair of embossing rollers to produce a matched opposite roller from the embossing roller of material having a Shore A hardness of 40-65; and~~
- c) ~~replacing one of each matched pair of embossing rollers with the roller~~

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produced from material having a Shore A hardness of 40-65.

5 11. The method of claim 10, wherein the step of producing a matched roller includes utilizing a laser to removing portions of the material from the outer surface of the roller produced from material having a Shore A hardness of 40-65.

10 12. The method of claim 10, wherein the roller having a Shore A hardness of 40-65 comprises material selected from the group consisting of natural rubber, synthetic rubber and plastic.

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15 ~~13.~~ A method for embossing a fibrous web containing contaminants to improve the bulk and softness of the web by passing the web through a nip formed by a pair of rotating rollers, wherein the contaminants will not damage the rollers, the method comprising:

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- 20 a) providing a first embossing roller having an outer surface, said outer surface having a plurality of male protuberances thereon corresponding to a desired embossed pattern;
- b) providing a second embossing roll having an outer surface having a plurality of female recessed portions which are matched to the male protuberances of the first roll;
- 25 c) wherein at least one of said first and second embossing rollers is a laser engraved roller and has a Shore A hardness of from about 40 to about 95; and

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